



#4

# SEQUENCE LISTING

<110> Cosgrove, Daniel J  
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<120> PURIFIED EXPANSIN PROTEINS

<130> 1194/1C114US3

<140> 09/092,160

<141> 1998-06-05

<150> 08/440,517

<151> 1995-05-12

<150> 08/242,090

<151> 1994-05-12

<150> 08/060,944

<151> 1993-05-12

<160> 7

<170> PatentIn Ver. 2.1

<210> 1

<211> 681

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: cDNA cucumber  
expansin

<400> 1

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accatgggtg gagcttgtgg gtatgggaat ttatacagcc aagggtatgg cacgaacacg  
120  
gtggcgctga gcactgcgct atttaacaat ggattaagtt gtggtgcttg cttcgaaatg  
180  
acttgtacaa acgaccctaa atggtgcctt ccgggaacta ttaggggtcac tgccaccaac  
240  
ttttgccttc ctaactttgc tctccctaac aacaatggtg gatggtgcaa ccctcctctc

OK

300  
 caacacttcg acatgggtga gcctgccttc cttcaaatacg ctcaataaccg agctgggtatc  
 360  
 gtccccgtct cctttcgtag ggtaccatgt atgaagaaag gtggagttag gtttacaatc  
 420  
 aatggccact catacttcaa cctcggttttg atcacaaacg tcggtggcgc aggcgacgtc  
 480  
 cactctgtgt cgataaaggg gtctcgaact ggatggcaat ccatgtctag aaattggggc  
 540  
 caaaactggc aaagcaacaa ctatctcaat ggccaaggcc tttcctttca agtcactctt  
 600  
 agtgatggtc gcactctcac tgcctataat ctcgttcctt ccaattggca atttggccaa  
 660  
 acctatgaag gccctcaatt c  
 681

<210> 2  
 <211> 228  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: rice expansin

<220>  
 <221> UNSURE  
 <222> 211  
 <223> Xaa is unknown or other.

<400> 2  
 Ala Gly Gly Gly Trp Val Asn Ala His Ala Thr Phe Tyr Gly Gly Gly  
 1 5 10 15  
 Asp Ala Ser Gly Thr Met Gly Gly Ala Cys Gly Tyr Gly Asn Leu Tyr  
 20 25 30  
 Ser Gln Gly Tyr Gly Thr Asn Thr Ala Ala Leu Ser Thr Ala Leu Phe  
 35 40 45  
 Asn Asn Gly Leu Ser Cys Gly Ala Cys Phe Glu Ile Arg Cys Gln Asn  
 50 55 60  
 Asp Gly Lys Trp Cys Leu Pro Gly Ser Ile Val Val Thr Ala Thr Asn  
 65 70 75 80  
 Phe Cys Pro Pro Asn Asn Ala Leu Pro Asn Asn Ala Gly Gly Trp Cys  
 85 90 95

Asn	Pro	Pro	Gln	Gln	His	Phe	Asp	Leu	Ser	Gln	Pro	Val	Phe	Gln	Arg
			100					105					110		
Ile	Ala	Gln	Tyr	Arg	Ala	Gly	Ile	Val	Pro	Val	Ala	Tyr	Arg	Arg	Val
		115					120					125			
Pro	Cys	Val	Arg	Arg	Gly	Gly	Ile	Arg	Phe	Thr	Ile	Asn	Gly	His	Ser
	130					135					140				
Tyr	Phe	Asn	Leu	Val	Leu	Ile	Thr	Asn	Val	Gly	Gly	Ala	Gly	Asp	Val
145					150					155					160
His	Ser	Ala	Met	Val	Lys	Gly	Ser	Arg	Thr	Gly	Trp	Gln	Ala	Met	Ser
			165						170					175	
Arg	Asn	Trp	Gly	Gln	Asn	Trp	Gln	Ser	Asn	Ser	Tyr	Leu	Asn	Gly	Gln
			180					185					190		
Ser	Leu	Ser	Phe	Lys	Val	Thr	Thr	Ser	Asp	Gly	Gln	Thr	Ile	Val	Ser
		195					200					205			
Asn	Asn	Xaa	Ala	Asn	Ala	Gly	Trp	Ser	Phe	Gly	Gln	Thr	Phe	Thr	Gly
	210					215					220				
Ala	His	Val	Arg												
225															

<210> 3  
 <211> 222  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: rice expansin

<220>  
 <221> UNSURE  
 <222> (14)..(58)  
 <223> Xaa is unknown or other.

<400> 3															
His	Met	Gly	Pro	Trp	Ile	Asn	Ala	His	Ala	Thr	Phe	Tyr	Xaa	Xaa	Gly
1				5					10					15	
Asp	Ala	Xaa	Xaa	Thr	Met	Gly	Gly	Ala	Cys	Gly	Tyr	Gly	Asn	Leu	Tyr
			20					25					30		



<222> (2)..(227)

<223> Xaa is unknown or other.

<400> 4

Lys	Xaa	Ser	Val	Ala	Gln	Ser	Ala	Phe	Ala	Thr	Phe	Tyr	Gly	Gly	Lys
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Asp	Gly	Ser	Cys	Thr	Met	Gly	Gly	Ala	Cys	Gly	Tyr	Gly	Asn	Leu	Tyr
			20					25					30		

Asn	Ala	Gly	Tyr	Gly	Leu	Tyr	Asn	Ala	Ala	Leu	Ser	Ser	Ala	Leu	Phe
		35					40					45			

Asn	Asp	Gly	Ala	Met	Cys	Gly	Ala	Cys	Tyr	Thr	Ile	Thr	Cys	Asp	Thr
	50					55					60				

Ser	Gln	Thr	Lys	Trp	Cys	Lys	Pro	Gly	Gly	Asn	Ser	Ile	Thr	Ile	Thr
65					70					75					80

Ala	Thr	Asn	Leu	Cys	Xaa	Pro	Asn	Trp	Ala	Leu	Pro	Ser	Asn	Ser	Gly
				85					90					95	

Gly	Trp	Cys	Asn	Pro	Pro	Leu	Xaa	His	Phe	Asp	Met	Ser	Gln	Pro	Ala
			100					105					110		

Trp	Glu	Asn	Ile	Ala	Val	Tyr	Gln	Ala	Gly	Ile	Val	Pro	Val	Asn	Tyr
		115					120					125			

Lys	Arg	Val	Pro	Xaa	Gln	Arg	Ser	Gly	Gly	Ile	Arg	Phe	Ala	Ile	Ser
	130					135					140				

Gly	His	Asp	Tyr	Phe	Glu	Leu	Val	Thr	Val	Thr	Asn	Val	Gly	Gly	Ser
145					150					155					160

Gly	Val	Val	Ala	Gln	Met	Ser	Ile	Lys	Gly	Ser	Asn	Thr	Gly	Trp	Met
				165					170					175	

Ala	Met	Ser	Arg	Asn	Trp	Gly	Ala	Asn	Trp	Gln	Ser	Asn	Ala	Tyr	Leu
			180					185					190		

Ala	Gly	Gln	Ser	Leu	Ser	Phe	Ile	Val	Gln	Leu	Asp	Asp	Gly	Arg	Lys
		195					200					205			

Val	Thr	Ala	Trp	Asn	Xaa	Ala	Pro	Xaa	Asn	Trp	Leu	Xaa	Xaa	Xaa	Xaa
	210					215					220				

Xaa	Xaa	Xaa
225		

<210> 5  
 <211> 225  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Arabidopsis  
 expansin

<400> 5  
 Asp Asn Gly Gly Trp Glu Arg Gly His Ala Thr Phe Tyr Gly Gly Ala  
   1                  5                  10                  15  
 Asp Ala Ser Gly Thr Met Gly Gly Ala Cys Gly Tyr Gly Asn Leu His  
           20                  25                  30  
 Ser Gln Gly Tyr Gly Leu Gln Thr Ala Ala Leu Ser Thr Ala Leu Phe  
           35                  40                  45  
 Asn Ser Gly Gln Lys Cys Gly Ala Cys Phe Glu Leu Thr Cys Glu Asp  
       50                  55                  60  
 Asp Pro Glu Trp Cys Ile Pro Gly Ser Ile Ile Val Arg Tyr Asn Leu  
   65                  70                  75                  80  
 Ala Asn Phe Ala Leu Ala Asn Asp Asn Gly Gly Trp Cys Asn Pro Pro  
           85                  90                  95  
 Leu Lys His Phe Asp Leu Ala Glu Pro Ala Phe Leu Gln Ile Ala Gln  
           100                  105                  110  
 Tyr Arg Ala Gly Ile Val Pro Val Ala Phe Arg Arg Val Pro Cys Glu  
       115                  120                  125  
 Lys Gly Gly Gly Ile Arg Phe Thr Ile Asn Gly Asn Pro Tyr Phe Asp  
       130                  135                  140  
 Leu Val Leu Ile Thr Asn Val Gly Gly Ala Gly Asp Ile Arg Ala Val  
   145                  150                  155                  160  
 Ser Leu Lys Gly Ser Lys Thr Asp Gln Trp Gln Ser Met Ser Arg Asn  
           165                  170                  175  
 Trp Gly Gln Asn Trp Gln Ser Asn Thr Tyr Leu Arg Gly Gln Ser Leu  
       180                  185                  190  
 Ser Phe Gln Val Thr Asp Ser Asp Gly Arg Thr Val Val Ser Tyr Asp

	195		200		205										
Val	Val	Pro	His	Asp	Trp	Gln	Phe	Gly	Gln	Thr	Phe	Glu	Gly	Gly	Gln
	210					215					220				

Phe  
225

<210> 6  
 <211> 226  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Arabidopsis  
 expansin

<400> 6

Asp	Tyr	Ser	Ser	Trp	Gln	Ser	Ala	His	Ala	Thr	Phe	Tyr	Gly	Gly	Gly
1				5					10					15	
Asp	Ala	Ser	Gly	Thr	Met	Gly	Gly	Thr	Cys	Gly	Tyr	Gly	Asn	Leu	Tyr
			20					25					30		
Ser	Thr	Gly	Tyr	Thr	Asn	Thr	Ala	Ala	Leu	Ser	Thr	Val	Leu	Phe	Asn
		35					40					45			
Asp	Gly	Ala	Ala	Cys	Arg	Ser	Cys	Tyr	Glu	Leu	Arg	Cys	Asp	Asn	Asp
	50					55					60				
Gly	Gln	Trp	Cys	Leu	Pro	Gly	Ser	Val	Thr	Val	Thr	Ala	Thr	Asn	Leu
65					70					75					80
Cys	Pro	Pro	Asn	Tyr	Ala	Leu	Pro	Asn	Asp	Asp	Gly	Gly	Trp	Cys	Asn
			85						90					95	
Pro	Pro	Arg	Pro	His	Phe	Asp	Met	Ala	Glu	Pro	Ala	Phe	Leu	Gln	Ile
			100					105					110		
Gly	Val	Tyr	Arg	Ala	Gly	Ile	Val	Pro	Val	Ser	Tyr	Arg	Arg	Val	Pro
		115					120					125			
Cys	Val	Lys	Lys	Gly	Gly	Ile	Arg	Phe	Thr	Ile	Asn	Gly	His	Ser	Tyr
	130					135					140				
Phe	Asn	Leu	Val	Leu	Val	Thr	Asn	Val	Ala	Gly	Pro	Gly	Asp	Val	Gln
145					150					155					160

Ser Val Ser Ile Lys Gly Ser Ser Thr Gly Trp Gln Pro Met Ser Arg  
165 170 175

Asn Trp Gly Gln Asn Trp Gln Ser Asn Ser Tyr Leu Asp Gly Gln Ser  
180 185 190

Leu Ser Phe Gln Val Ala Val Ser Asp Gly Arg Thr Val Thr Ser Asn  
195 200 205

Asn Val Val Pro Ala Gly Trp Gln Phe Gly Gln Thr Phe Glu Gly Gly  
210 215 220

Gln Phe  
225

<210> 7  
<211> 227  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: cucumber  
expansin

<400> 7  
Asp Tyr Gly Gly Trp Gln Ser Gly His Ala Thr Phe Tyr Gly Gly Gly  
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Asp Ala Ser Gly Thr Met Gly Gly Ala Cys Gly Tyr Gly Asn Leu Tyr  
20 25 30

Ser Gln Gly Tyr Gly Thr Asn Thr Val Ala Leu Ser Thr Ala Leu Phe  
35 40 45

Asn Asn Gly Leu Ser Cys Gly Ala Cys Phe Glu Met Thr Cys Thr Asn  
50 55 60

Asp Pro Lys Trp Cys Leu Pro Gly Thr Ile Arg Val Thr Ala Thr Asn  
65 70 75 80

Phe Cys Pro Pro Asn Phe Ala Leu Pro Asn Asp Asp Gly Gly Trp Cys  
85 90 95

Asn Pro Pro Leu Gln His Phe Asp Met Ala Glu Pro Ala Phe Leu Gln  
100 105 110

Ile Ala Gln Tyr Arg Ala Gly Ile Val Pro Val Ser Phe Arg Arg Val



115		120		125
Pro Cys Met Lys Lys Gly Gly Val Arg Phe Thr Ile Asn Gly His Ser				
130		135		140
Tyr Phe Asn Leu Val Leu Ile Thr Asn Val Gly Gly Ala Gly Asp Val				
145		150		155
				160
His Ser Val Ser Ile Lys Gly Ser Arg Thr Gly Trp Gln Ser Met Ser				
		165		170
				175
Arg Asn Trp Gly Gln Asn Trp Gln Ser Asn Asn Tyr Leu Asn Gly Gln				
		180		185
				190
Gly Leu Ser Phe Gln Val Thr Leu Ser Asp Gly Arg Thr Leu Thr Ala				
		195		200
				205
Tyr Asn Leu Val Pro Ser Asn Trp Gln Phe Gly Gln Thr Tyr Glu Gly				
		210		215
				220
Pro Gln Phe				
225				